

A REVIEW ON THE EFFECT OF COMBINING ABILITY ON YIELD AND YIELD ATTRIBUTING CHARACTERISTICS IN FLAX SEED/LINSEED (LINUM USITATISSIMUM)

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ABSTRACT

In India, Linseed can be cultivated largely for seed meant for eliminating oil, the amount of oil of the seed differs from 33-47%. The oil is edible in demand as a dietary supplement, as a source of alpha-linolenic acid. As linseed can be dried quickly under sun-drying process or through mechanical drier, it is used for ingredient of paint, varnishes, ink for painting, oil cloth, soap and many more. In parts of Europe, it is traditionally eaten with potatoes and quark Flax, also known as common flax or linseed, is a angiosperm plant, known as Linum usitatissimum, belongs to Linaceae family. Flax is cultivated for seeds, which are used for linseed oil or ground linseed, used as a nutritional supplement. Linseed flowers also have ornamental values. The oilcake remaining after the extraction of oil is a valuable source of nutrition for farm animals. This contains 36% of protein and fibers, also the digestibility ratio goes up to 85%. Linseed is good for the fight against blood cholesterol as it contains enough fiber. Linseed is a rich source of vitamin B2, many essential minerals for humans and animals. The significant positive GCA effects for most important characters indicated that the use of these parents in Linseed breeding programs could increase fiber yield. The mean squares of variances due to GCA and SCA play a significant role but also showed that the higher value of variation due to general combining ability was predominantly influenced by additive gene effects. As mean performance gets higher value, the GCA effect of the parent in majority of the characters under study was also similarly high. Specific Combining Ability effect is due to non-heritable effect, dominant effect, epistasis effect and the effect of SCA is can be identified as an indication of superior hybrid through heterosis breeding. The SCA value represents the interaction between the dominant gene and epistatic gene which are non-fixable in nature and related to heterosis.

KEYWORDS: *Linseed, Combining Ability, GCA Effect, SCA Effect*

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INTRODUCTION

Linseed(Linum usitatissimum) is a completely crucial seed and fiber crop. It is grown for its seeds and additionally for fiber. The seed consists of an oil that varies from thirty 3 to 47 percent in numerous varieties. Linseed oil is a great source for human nutrition, as a deliver of omega-three, (an omega-three fatty acid fatty acid). It is also used as an ingredient for varnish, paintings, saving materials from getting wet. In areas of Europe, it is traditionally eaten up with potatoes and quark. Most of the investigators are of the opinion that the wild flax Linum plant genus angustifolium, found in Mediterranean location may be the relative of the cultivated species genus Linum usitatissimum as the species have an equal frame range (2n=30). Flax, conjointly known as not unusual place flax or oilseed, will be a phanerogam, Linum usitatissimum, in the flax own circle of relatives. It is grown for consumption and rich source of fiber in areas colder climates where the average temperature is below 15 degrees (Allaby et . al. (2005). The critical oilseed developing international locations are Republic of India, Canada, FRG and USA.

Republic of India ranks preliminary in the global in relevancy expanse accounting for twenty 3 consistent with cent and 0.33 in manufacturing with a contribution of 9 consistent with cent (Chhidda et . al . (2019). Flax is cultivated for its grains, that is probably floor right for consumption or modified into oil that has use as a nutritionary complement partner degreed as an component in numerous wood-completing product. Flax is moreover adult as an ornamental plant in gardens. Flax seeds arise in 2 fundamental colorings brown or yellow (golden linseeds), (McHughen, et . al. (1990). Flax seeds manufacture linseed oil, this is the product of pressing of linseed to extract the oil, is one of the oldest oils used commercially. This is an partner fit for human consumption oil acquired via way of means of expeller urgent and usually accompanied via way of means of solvent extraction of solvent. Processed flax seed oil through solvents has been used for numerous centuries as an oil in portray and varnishing . The oil cake remaining immediately the oil is pressed out will be a very nutritious feed for animals. It is wise in fashion and consists of 36 consistent with cent incredible molecule, 85 consistent with cent of this is effortlessly digestible. It is fed to every liquid frame substance and completed animals and extensively utilized as natural manure. It consists of regarding 5 consistent with cent gas, 1.four consistent with cent phosphorus and one eighth consistent with cent potassium hydroxide (Chhidda, et . al . (2019). Linseed is a rich source of vitamin B2, many essential minerals for human and animals (Goyal A et . al. (2014). Lignans are plant compounds which have inhibitor and steroid properties, every of which may facilitate decrease the danger of most cancers and enhance fitness. Flax seeds are a great deliver of plant-primarily based totally incredible molecule, and there's developing hobby in linseed incredible molecule and its fitness advantages. Flax-seed supplementation confirmed a bit discount in serum globulin entirely in individuals with a B.M.I. large than thirty.

Effect of SCA on Linseed

Specific combining ability result estimates unconcealed an awfully wise vary of variation for all characters and area unit attributed to non- additive cistron effects that involve dominance and hypostasis elements of the genetic variation (Griffing et . al.). Sprague and Tatum (1942) reported that the SCA result is because of non-additive genetic proportion and also the result of Specific Combining Ability is taken into account a reliable index for the identification of superior hybrid. In general, the SCA effects don't contribute tangibly to the advance of self-fertilizing crops, except wherever industrial exploitation of heterosis is possible. It absolutely was fascinating to notice that the majority of the outstanding crosses were found to be common for variety of capsules per plant, variety of primary branch per plant and grain yield per plant having positive and important SCA values suggesting that these cross combos might be with success exploited for any yield improvement in flaxseed. Mohammadi et. al. conjointly discovered important SCA effects revealing the significant contribution of additive and non-additive cistron action for various traits in an exceedingly diallel cross victimization eight flax genotypes. Abdel-Moneam et . al. reported that the majority of the superior cross having important SCA result values for a selected attribute embody a minimum of one in every of their oldsters of high ground-controlled approach effects for constant attribute.

The SCA worth represents the dominance and epistatic interactions that area unit non-fixable in nature and associated with heterosis (Griffing, 1956). Therefore, if each or one in every of the oldsters concerned within the crosses with high SCA values they might be with success exploited in varietal improvement program and expected to present superior transgressive segregates (Kumar et al., 1994, Nie et al., 1991, Mishra and Rai, 1996).

Effect of GCA on Linseed

The magnitude relation of GCA/SCA indicated that additive compete a larger role than the non-additive cistron effects

within the inheritance of a number of characters of flaxseed (Haleem,2015). the numerous positive ground-controlled approach effects for many vital characters indicated that the employment of those oldsters in flaxseed breeding programs may increase fiber yield. oldsters are perceived to be smart combiners for the seed yield and subsequent increasing oil yield (Mahmud, 2021). General and specific combining ability were important for all the various traits and also the GCA/ SCA magnitude relation unconcealed the predominance of additive and additive x additive cistron action in dominant most of the traits (Sedhom,2016).The additive effects were a lot of vital than non-additive effects beneath all studied environments. The mean squares of variances because of cistronral and specific combining ability were important however conjointly showed that the upper magnitude of variance because of general combining ability was preponderantly influenced by additive gene effects (Sayed,2019).The High magnitude relation of GCA/SCA unconcealed that additive compete larger role than non-additive genetic effects within the inheritance of weight like traits in flaxseed and its elements yet as beneath the 2 environments and combined analysis. the easy correlation (r) between mean performance of oldsters and their ground-controlled approach values was important positive at each environments and combined information. In general, the magnitude of mean squares because of ground-controlled approach were larger than that because of SCA (El-Refaie,2012). Comparison of ground-controlled approach results with as such performance of oldsters unconcealed that ranking of parent supported as such norm was nearly same as that on the idea of ground-controlled approach effect for many of the characters. Combination for multiple oldsters is place in an exceedingly central pool would be useful in facilitating the recombination by breaking the undesirable genetic blocks (Premchandra Yadav, 2013). The as such performance of oldsters was for the most part connected with the overall hairdressing ability effects of the oldsters (Nirala,2018). Higher the worth of mean performance, larger was the overall hairdressing ability result of the parent in majority of the characters beneath study.

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